

**REMARKS**

Claims 1, 2 and 5-26 are all of the claims presently pending in the application. Claims 3 and 4 have been canceled without prejudice or disclaimer. Claims 1, 5-7, 15-20, 22, 24 and 25 have been amended to more particularly define the claimed invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 25 and 25 stand rejected under 35 U.S.C. 112, first paragraph, for failing to comply with the best mode requirement. Claims 25 and 26 stand rejected under 35 U.S.C. 112, second paragraph, for failing to comply with the enablement requirement.

Claims 13, 22 and 23 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1-3, 13 and 16 stand rejected under 35 U.S.C. 102(b) as being anticipated by Baglin et al. (U.S. Patent No. 6,331,364; hereinafter “Baglin”). Claims 1-3, 11, 13, 14, 20, 21, 25 and 26 stand rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (U.S. Patent No. 6,165,803; hereinafter “Chen”). Claims 1-4, 7-11, 13, 19, 22 and 24-26 stand rejected under 35 U.S.C. 102(b) as being anticipated by Fontana Jr. et al. (U.S. Patent No. 6,168,845; hereinafter “Fontana”). Claims 1-11, 13-15, 17, 19 and 22-26 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kamata et al. (U.S. Patent Application Publication No. 2002/0142192; hereinafter “Kamata”). Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over

Kamata in view of Ning et al. (U.S. Patent Application Publication No. 2002/0098676; hereinafter “Ning”). Claim 16 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kamata in view of Baglin. Claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kamata. Claims 20 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kamata in view of Chen.

These rejections are respectfully traversed in the following discussion.

## **I. THE CLAIMED INVENTION**

The claimed invention of exemplary claim 1 is directed to a method of patterning a magnetic thin film. The method includes transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical transformation, where the chemical transformation includes using a fluorine-based reactive plasma.

## **II. THE BEST MODE REJECTION**

Claims 25 and 26 stand rejected under 35 U.S.C. 112, first paragraph, for allegedly failing to disclose the best mode contemplated by the Examiner. Specifically, the Examiner alleges that “[e]vidence of concealment of the best mode is based upon Figs. 1-4 and the instant disclosure” (see Office Action dated April 10, 2006 at page 3). The Examiner, however, is clearly incorrect.

That is, the Examiner has not set forth an adequate best mode rejection. Indeed, the M.P.E.P. sets forth that “[d]etermining compliance with the best mode requirement requires a two-prong inquiry. First, it must be determined whether, at the time the application was filed, the inventor possessed a best mode for practicing the invention. This is a subjective inquiry which focuses on the inventor’s state of mind at the time of

filings. Second, if the inventor did possess a best mode, it must be determined whether the written description disclosed the best mode such that a person skilled in the art could practice it" (see M.P.E.P. 2165). More specifically, the Examiner must first provide specific evidence that the inventor(s) had information in their possession at the time the application was filed that a mode was considered to be better than any others by the inventor. If this first prong is met, then the Examiner must compare the known best mode with the mode that is disclosed. That is, the Examiner must determine whether the disclosure is "adequate to enable one skilled in the art to practice the best mode" (see M.P.E.P. 2165.03).

In other words, a "best mode rejection is proper only when the first inquiry can be answered in the affirmative, and the second inquiry answered in the negative with reasons to support the conclusion that the specification is non-enabling with respect to the best mode" (see M.P.E.P. 2165.03; emphasis added by Applicants). The Examiner has not provided any reasoning to support his allegations that the inventors have failed to disclose the best mode for carrying out the invention.

Finally, Applicants point out that "[i]t is extremely rare that a best mode rejection properly would be made in *ex parte* prosecution. The information that is necessary to form the basis for a rejection based on the failure to set forth the best mode is rarely accessible to the examiner, but is generally uncovered during discovery procedures in interference, litigation, or other *inter partes* procedures" (see M.P.E.P. 2165.03).

Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

### **III. THE ENABLEMENT REQUIREMENT REJECTION**

Claims 25 and 26 stand rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement. Specifically, the Examiner alleges that the device disclosed in the application does not appear to be a MTJ device as recited in claims 25 and 26. The Examiner, however, is clearly incorrect.

Applicants submit that the Examiner has failed to provide a proper lack of enablement rejection. That is, the test for enablement is whether a person of ordinary skill in the art could make and use the invention from the disclosure in the specification coupled with information known in the art without undue experimentation. The initial burden is on the Examiner to establish a reasonable basis for questioning the adequacy of the disclosure to make and use the invention with undue experimentation. The Examiner has failed to even address the issue of undue experimentation, which is the essence of an enablement requirement rejection. Therefore, the Examiner has clearly failed to meet his initial burden.

However, Applicants submit that the disclosure of the invention in the Application is clearly adequate to meet the enablement requirement set forth in 35 U.S.C. 112, first paragraph.

That is, Figure 2A of the Application clearly depicts a tunnel junction 220 formed in the magnetic layer 250 over the substrate 210 (e.g., see Application at page 9, lines 11-14). Therefore, one of ordinary skill in the art would clearly be able to make and use the claimed invention of claims 25 and 26 without undue experimentation.

Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

#### **IV. THE INDEFINITENESS REJECTION**

Claims 13, 22 and 23 stand rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite.

Regarding claims 22 and 23, the term “pattern” has been replaced with the term “remove”, as suggested by the Examiner.

However, regarding claim 13, Applicants submit that the Examiner is clearly incorrect.

Specifically, the Examiner inquires “[w]hat is the difference between the magnetic device produced by claim 1 and that of claim 13?” (see Office Action dated October 28, 2005 at page 4).

Applicants respectfully submit (as previously argued by Applicants in the Response filed on December 28, 2005) that claim 1 does not recite “producing a magnetic device”. Indeed, claim 1 clearly recites “a method of patterning a magnetic thin film”. Claim 13 further limits the subject matter of claim 1 by claiming the additional step of producing a magnetic device after the limitation of “transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical formation”. A person reasonably skilled in the art would clearly understand what is meant by the phrase “producing a magnetic device” and that “producing a magnetic device” is clearly different from “transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical formation”.

Applicants point out that if the Examiner wishes to continue to maintain this rejection that the Examiner must respond to Applicants traversal arguments provided herein and previously provided as indicated above.

Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

## **V. THE PRIOR ART BASED REJECTIONS**

### **A. The Kamata Reference**

Claims 1-11, 13-15, 17, 19 and 22-26 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kamata. Additionally, claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kamata. Applicants submit, however, that there are features of the claimed invention that are not taught or suggested by Kamata.

That is, Kamata does not teach or suggest “*transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical transformation, said chemical transformation comprises a fluorine-based reactive plasma*”, as recited in exemplary claim 1.

Indeed, Kamata is merely directed to disk applications. However, the knowledge of the conductive properties of the final film are not present in Kamata.

The claimed invention indicates that the transformed material is insulating, which allows for the separation (electrically) of neighboring devices without further patterning.

Kamata, however, does not mention insulative properties, let alone teach or suggest that the thin film is electrically insulating.

Therefore, Applicants submit that there are features of the claimed invention that are not taught or suggested by Kamata. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

#### **B. The Baglin Reference**

The Examiner alleges that Baglin teaches the claimed invention of claims 1-3, 13 and 16. Furthermore, the Examiner alleges Baglin would have been combined with Kamata to teach the claimed invention of claim 16. Applicants submit, however, that are features of the claimed invention that are not taught or suggested by Baglin.

That is, Baglin does not teach or suggest “*transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical transformation, said chemical transformation comprises a fluorine-based reactive plasma*”*,* as recited in exemplary claim 1.

Indeed, Baglin discusses ion irradiation. In Baglin, the ion energy is one of the principal knobs to create disorder and to change magnetic properties. The claimed invention is directed to a low-power process that uses a chemical transformation and not a physical transformation.

Baglin, however, uses a physical transformation. Furthermore, Baglin does not use a resist as a mask. Baglin instead uses a non-contact mask.

Therefore, there are features of the claimed invention that are not taught or suggested by Baglin. Therefore, Baglin does not teach or suggest the claimed invention, nor does Baglin make up the deficiencies of Kamata.

### **C. The Fontana Reference**

The Examiner alleges that Fontana teaches the claimed invention of claims 1-4, 7-11, 13, 19, 22 and 24-26. Applicants submit, however, that there are features of the claimed invention that are not taught or suggested by Fontana.

That is, Fontana does not teach or suggest *“transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical transformation, said chemical transformation comprises a fluorine-based reactive plasma”*, as recited in exemplary claim 1.

Indeed, Fontana exclusively uses oxidation, whereas the claimed invention recites a fluorine-base conversion. Additionally, Fontana does not teach or suggest the insulating properties of the film of the claimed invention.

Therefore, Applicants submit that there are features of the claimed invention that are not taught or suggested by Fontana. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

### **D. The Chen Reference**

The Examiner alleges that Chen teaches the claimed invention of claims 1-3, 11, 13, 14, 20, 21, 25 and 26. Furthermore, the Examiner alleges that Chen would have been combined with Kamata to teach the claimed invention of claims 20 and 21. Applicants submit, however, that there are features of the claimed invention that are not taught or suggested by Chen.

That is, Chen does not teach or suggest “*transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical transformation, said chemical transformation comprises a fluorine-based reactive plasma*”, as recited in exemplary claim 1.

Indeed, Chen teaches the use of oxidation and nitridation for transformation. Chen does not, however, teach or suggest transformation using halogens as in the claimed invention.

Therefore, there are features of the claimed invention that are not taught or suggested by Chen. Therefore, Chen does not teach or suggest the claimed invention, nor does Chen make up the deficiencies of Kamata.

#### **E. The Ning Reference**

The Examiner alleges that Ning would have been combined with Kamata to teach the claimed invention of claim 12. Applicants submit, however, that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention.

That is, as detailed in section A, above, Kamata does not teach or suggest “*transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical transformation, said chemical transformation comprises a fluorine-based reactive plasma*”, as recited in exemplary claim 1.

Furthermore, Applicants submit that Ning fails to make up the deficiencies of Kamata. Indeed, the Examiner does not even allege that Ning teaches or suggests transforming a portion of the magnetic thin film to be non-magnetic and electrically

insulating using a chemical transformation. Indeed, the Examiner merely relies upon Ning as teaching providing a mask for patterning.

Thus, Ning fails to make up the deficiencies of Kamata.

Therefore, Applicants submit that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

## **VI. FORMAL MATTERS AND CONCLUSION**

In accordance with the Examiner's objection to the claims, the claims have been amended. Specifically, the term "converting" has been replaced with the term "transforming" as provided in the complete listing of claims above.

However, regarding the Examiner's objection to claim 13, as being of improper dependent form, the Examiner is clearly incorrect. ". Indeed, claim 1 clearly recites "a method of patterning a magnetic thin film". Claim 13 further limits the subject matter of claim 1 by claiming the additional step of producing a magnetic device after the limitation of "transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical formation". A person reasonably skilled in the art would clearly understand what is meant by the phrase "producing a magnetic device" and that "producing a magnetic device" is clearly different from "transforming a portion of the magnetic thin film to be non-magnetic and electrically insulating using a chemical formation". Therefore, claim 13 clearly further limits the subject matter of claim 1 and therefore is clearly in proper dependent form.

In view of the foregoing, Applicants submit that claims 1, 2 and 5-26, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview. The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 50-0510.

Respectfully Submitted,

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